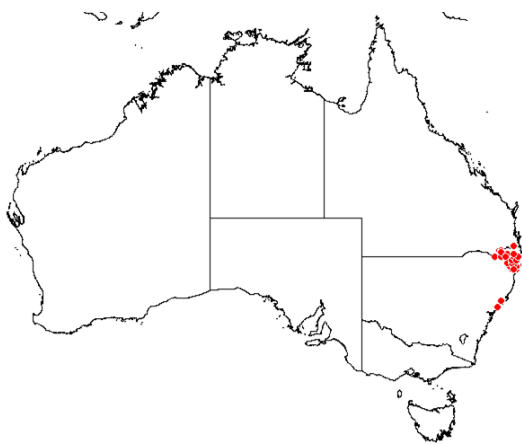


## Pure Australian Tea Tree Oil (*Melaleuca alternifolia*) Offers Significant Advantages over Adulterated Oils Masquerading as Tea Tree

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### Proven Power

Tea Tree Oil (TTO) is distilled from *Melaleuca alternifolia*, a tall shrub of up to 23 feet (7 meters) height with a papery bark. This plant only occurs naturally in the world in Australia along streams and swampy lowlands of the Mid- and North-Coast of NSW, and South-East Queensland.



Australian Tea Tree Oil has been used for decades in the pure form and as the active ingredient in formulated products to maintain the health of millions of people throughout the world. The capabilities of this unique and demonstrated anti-bacterial<sup>1</sup>, anti-fungal<sup>1,2</sup>, anti-viral<sup>1,3</sup>, anti-inflammatory<sup>4</sup>, and anti-septic essential oil was first scientifically documented in 1905.<sup>5,6,7</sup>

More recently, its anti-carcinogenic activity potential has been identified and published.<sup>8</sup>

In addition to the proof from thousands of years of use by Indigenous Australians, over nine hundred peer-reviewed studies have been conducted on pure Australian TTO. These studies document and explain its safety and efficacy both as pure oil and in countless formulations worldwide.

**“Over 900 peer-reviewed studies have been conducted on pure Australian Tea Tree Oil.”**

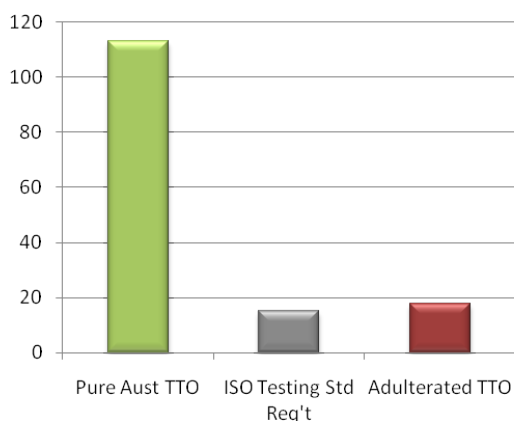
These studies leave no doubt about its safety and effectiveness when used correctly. In addition to this extensive body of scientific work, there are countless testimonials and references to TTO on the internet from satisfied users globally.

### Unique Complexity

The uniqueness of pure Australian TTO is in the inherent complexity of its 113+ compounds. These compounds work synergistically to produce a superior result to any one, or abbreviated combination, of individual constituents. Numerous scientific and clinical studies comparing the activity of both the main component of tea tree oil, terpinen-4-ol<sup>9-11</sup> and pure tea tree oil<sup>8-10</sup> have been conducted and published in well-recognized peer reviewed journals. In a paper published in 2010 by Greay *et al*<sup>8</sup> the activity of pure Australian TTO and terpinen-4-ol was examined. The research demonstrated that pure Australian TTO was significantly more effective than terpinen-4-ol alone.

This study demonstrated that the efficacy of pure TTO is more than the sum of its parts and reinforces the potency of pure Australian Tea Tree Oil in its natural state. No known testing has been done to assess the efficacy, let alone safety, of adulterated tea tree oil.

**A Comparison of Standard Tea Tree Oil Constituents**



The natural complexity of TTO's 113+ compounds may also mitigate the development of resistance in pathogens such as MRSA and reduce the prevalence of superbugs. It is conceivable that with rising concerns about antibiotic resistance, therapeutic solutions will involve the use of natural remedies such as pure Australian TTO for the treatment of human and animal ailments.

## Adulterated and Synthetic Oils Cheat Consumers

Unfortunately as the proven effectiveness of pure Australian TTO has become more widely recognised and used, a market has developed for adulterated oil consisting of Australian TTO diluted with so-called 'industrial waste': by-products of the distillation/fractionation of pine, Eucalyptus and white camphor oils. In some instances 100% pure 'industrial waste' is bottled and sold as '100% pure TTO'. Less commonly,

"Nature Identical" oil is created synthetically from only 15 of the 113+ components of Tea Tree Oil as listed in the Australian Standard <sup>15</sup> (AS 2782-2017) and the International Standard <sup>16</sup> (ISO 4730-2017) for Tea Tree Oil.

Manufacturers of these adulterated oils adjust the mix of added components in an attempt to mimic many of the physical properties of their oil to make it appear to conform to the ISO or other Standards. This can include the optical rotation of the product which has in the past made detection of adulterated oils difficult.

This has now changed with the inclusion of the chiral (enantiomeric) ratio for terpinen-4-ol in the 2017 revision of ISO 4730.

**It is important to understand that these adulterated products masquerading as TTO have no scientific evidence to support their safety or effectiveness.**

In addition, adulterated oils are not supported by the thousands of years of use by the Australian Aboriginal indigenous population and may also be putting consumers at significant risk of exposure to contaminants that cause dermatitis or other more serious ailments. At the very least a poor consumer experience with these adulterated oils will inevitably turn consumers away from using tea tree oil entirely.

The production and sale of adulterated tea tree oil is based on pure greed and cheats both the expectant consumer and the hard-working grower. The consumer is cheated by unwittingly supporting this fraudulent commercial practice, not to mention the right to use an essential oil proven to work safely and effectively. The grower is cheated as the cost of bringing these adulterated products to market may be significantly lower than what it costs an Australian farmer to sustainably produce genuine 100% pure Australian TTO.

## Identifying Adulterated Tea Tree Oil

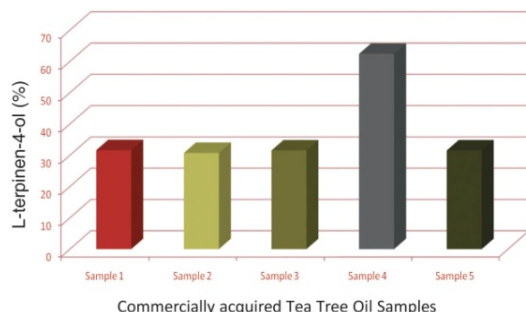
Fortunately, awareness of this fraudulent practice has precipitated the Essential Oils committee of the International Standards Organization (ISO) to develop and publish an updated ISO Standard (ISO4730-2017) defining what constitutes 100% pure TTO.

Some essential oil components can exist in two enantiomeric forms designated as (R) or (S), D or L or (+) or (-) isomers. **Many enantiomers have distinctly different properties and hence their presence in the right form is critical.**

A pure, natural essential oil contains enantiomers in known and characteristic ratios. This ratio is upset by the addition of adulterants including synthetic major components of different enantiomeric ratios.

In addition to tightening the ranges of many constituents of Tea Tree Oil and its physical properties, the new ISO Standard includes a recommendation to test for the chiral/ enantiomeric properties of terpinen-4-ol. As illustrated in the graph below, pure TTO has a ratio of around 30:70 for the L:R enantiomers of terpinen-4-ol. Sample 4 is heavily adulterated.

Chiral Analysis of Tea Tree Oil L-terpinen-4-ol



ISO 4730 now specifies this enantiomeric ratio for terpinen-4-ol as (R)(+) 67 %-71 % and (S)(-) 29 %-33 %.

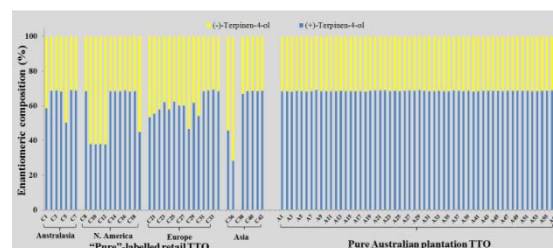
This means that the measurement of the chiral (enantiomeric) ratio of terpinen-4-ol

provides a significant extra measure of essential oil authenticity.

Championed by the Australian Tea Tree Industry Association (ATTIA), Chiral Analysis is a simple and inexpensive test that allows anyone in the TTO supply chain to quickly and clearly differentiate between a 100% pure and natural TTO and an adulterated product masquerading as TTO.

A new article documenting the laboratory method for confirming the authenticity and purity of Australian Tea Tree Oil “*Enantiomeric distribution of selected terpenes for authenticity assessment of Australian Melaleuca alternifolia oil*”, has been published in the May 2015 issue of the [Journal of Industrial Crops and Products](#).<sup>17</sup>

The study authors, from Monash University (Melbourne, Australia) and University of Tasmania (Tasmania, Australia), in conjunction with the Australian Tea Tree Industry Association (ATTIA), confirmed the validity of this new chiral testing methodology using 57 authentic, known provenance samples of 100% pure Australian (*Melaleuca alternifolia*) Tea Tree Oil. The authors further assessed 43 samples of commercially available tea tree oil obtained from retail outlets in major markets across Asia, Europe, and North America. The results were revealing, as illustrated in the figure shown below which clearly differentiates between fake and 100% pure tea tree oil.





## Certification and Traceability of Pure Australian Tea Tree Oil

In addition to championing the revision of the ISO 4730 Standard which now provides a significant extra measure of essential oil authenticity through Chiral Purity testing ATTIA, with the support of the Australian Government's Rural Industries Research and Development Corporation (RIRDC), has developed a world first for the essential oils industry: an extensive quality management system (QMS) specifically designed for all facets of the production of 100% pure Australian TTO. This includes growing, harvesting, production, storage, packaging and shipping which includes full traceability of the TTO from the leaf to the bottle.

The implementation of this strict Code of Practice (CoP) under which ATTIA's producer members operate plantations has established full traceability and consistency of Australian TTO quality from the farm to the point of export and beyond.

This system includes not only traceability but also adherence to environmentally sound farming practices. **ATTIA's CoP seal guarantees the product is 100% Pure Australian TTO with full traceability back to the leaf.**

## Conclusion

By purchasing ATTIA COP certified Pure Australian TTO you are guaranteed and most importantly uniquely placed to assure your customers that they are buying a pure, natural product which is comprehensively proven to be safe and effective for its intended use.

To find out how your organization can be assured it is using Pure Australian Tea Tree Oil, look for this logo and demand to see your supplier's Code of Practice certification, or contact ATTIA directly at [secretary@attia.org.au](mailto:secretary@attia.org.au).



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